CLAIMS

1. A method of preparing an abuse deterrent pharmaceutical composition comprising opioid-containing particles enclosed by a layer comprising titanium oxide, the method comprising the sequential steps of:

(a) loading the opioid-containing particles into a reactor;

(b) applying a vaporous or gaseous metal precursor to the opioid-containing particles in the reactor;

(c) performing one or more pump-purge cycles of the reactor using inert gas;

(d) applying a vaporous or gaseous oxidant to the opioid-containing particles in the reactor; and

(e) performing one or more pump-purge cycles of the reactor using inert gas;

wherein the coating layer reduces the crushability of the opioid-containing particles, and the coating layer has a thickness in the range of 100-200 nm.

2. The method of claim 1, wherein the sequential steps (b)-(e) are repeated one or more times to increase the total thickness of the layer.

3. The method of claim 1, wherein the reactor pressure is allowed to stabilize following step (a) to less than 1 Torr, following step (b) to at least 1 Torr, and/or following step (d) to at least 1 Torr.

4. The method of claim 1, wherein the reactor contents are agitated prior to and/or during step (b), step (c), and/or step (e).

5. The method of claim 1, wherein a subset of vapor or gaseous content is pumped out prior to step (c) and/or step (e).

6. The method of claim 1, wherein the opioid-containing particles comprise one or more pharmaceutically acceptable excipients.

7. The method of claim 1, wherein the opioid-containing particles have a median particle size, on a volume average basis between 0.1 µm and 1000 µm.

8. The method of claim 1, wherein the pharmaceutical composition is removed from the reactor and admixed with a pharmaceutically acceptable diluent or carrier.

9. The method of claim 1, wherein the opioid-containing particles consist essentially of an opioid.

10. The method of claim 1, wherein the opioid-containing particles have a median particle size, on a volume average basis, of less than 10 microns.

11. The method of claim 1, wherein the opioid-containing particles have a median particle size, on a volume average basis, of less than 1 micron.

12. The method of claim 1, wherein the opioid-containing particles have a median particle size, on a volume average basis, of less than 100 nanometers.